Alg. 2 Warm Up #2-3

Solve:

1) $6 \mid 2 - x \mid + 3 > 18$

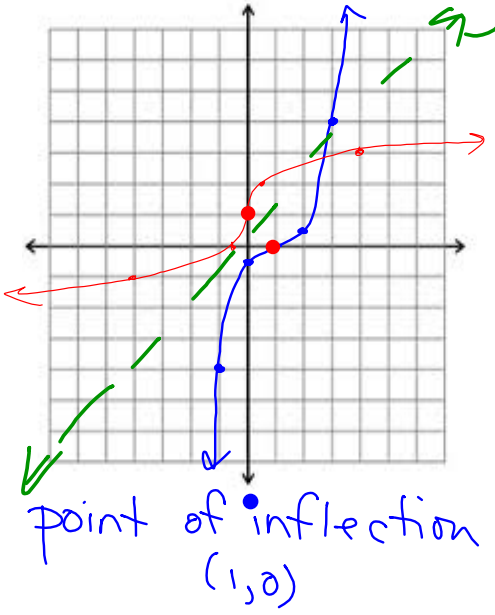
2) $10 + \frac{5}{2} \mid x + 4 \mid < 35$

3) $-6 \mid 8 - x \mid < 18$

HW Questions:

Review & Preview

5-26. Make a graph of $f(x) = \frac{1}{2}(x-1)^3$ and then graph its inverse on the same set of axes.



x	y
-1	-4
0	$-\frac{1}{2}$
1	0
2	$\frac{1}{2}$
3	4

x	y
-4	-1
$-\frac{1}{2}$	0
0	1
$\frac{1}{2}$	2
4	3

5-27. Write the inverse equation for each of the following equations.

a. $y = 3x - 8$ b. $y = \frac{1}{2}x + 6$ c. $y = \frac{x+6}{2}$

5-28. Solve the equation $3 = 8^x$ for x, accurate to the nearest hundredth (two decimal places).

$0 < x < 1$

$8^{.5}$ 2.83 $8^{.6}$ 3.48

$8^{.55} \approx 3.14$

$8^{.53} \approx 3.01$

$8^{.52} \approx 2.95$

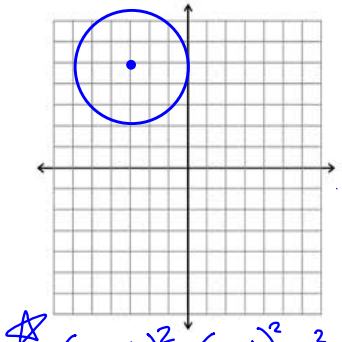
$x \approx 0.53$

5-29. Multiply each expression below.

a. $(x+2)(x-7)$ b. $(3m+7)(2m-1)$

c. $(x-3)^2$ d. $(2y+3)(2y-3)$

5-30. Write the equation of a circle with a center at (–3, 5) that is tangent to the y-axis (in other words, it touches the y-axis at only one point). Sketching a picture will help.



$(x-h)^2+(y-k)^2=r^2$

$(h,k) \rightarrow$ center

$r =$ radius.

5-31. Perform the indicated operation to simplify each of the following expressions. In some cases, factoring may help you simplify.

a. $\frac{(x+2)(x-3)}{(x+1)(x-4)} \cdot \frac{(x+1)}{x(x+2)}$

b. $\frac{x^2+5x+6}{x^2-4} \cdot \frac{4}{x+3}$

c. $\frac{2x}{x+4} + \frac{8}{x+4}$

d. $\frac{x}{x+1} - \frac{1}{x+1}$

5-32. Barnaby's grandfather is always complaining that back when he was a teenager, he used to be able to buy his girlfriend dinner for only \$1.50.

a. If that same dinner that Barnaby's grandfather purchased for \$1.50 sixty years ago now costs \$25.25, and the price has increased exponentially, write an equation that will give you the costs at different times.

b. How much would you expect the same dinner to cost in 60 years?

$y = ab^x$ $\quad 25.25 = 1.50(b)^{60}$

$16.83 \quad 1.5$

$\sqrt[60]{b^{60}} = \sqrt[60]{16.83}$ $\quad$ 60 MATH $\sqrt[x]{}$

$b \approx 1.048$

STO→ ALPHA B $\quad$ ( ) $\wedge$ (1 ÷ 60)

$y = 25.25(B)^{60}$

$y \approx 425.04$

Yesterday's CP's: 5 - # 16 ---> 18

5.1.2 How can I find an inverse?

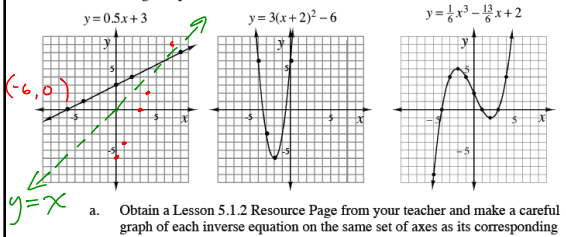
Using a Graph to Find an Inverse

What factors would you consider if you were thinking about buying a car? The first things that come to mind might be color or cost, but increasingly people are considering fuel efficiency (the number of miles a car can drive on a gallon of gas). You can think of the average number of miles per gallon that a car gets as a function that has *gallons* as the input and *miles traveled* as the output. A graph of this function would allow you to use what you know about the number of gallons in your tank to predict how far you could travel.

What would happen if you wanted to look at this situation differently? Imagine you regularly travel a route where there are many miles between gas stations. In this scenario, you would start with the information of the number of miles to the next filling station, and want to determine how many gallons of gas you would need to get there. In this case, you would start with the number of miles and work backwards to find gallons. Your new function would reverse the process.

5-16. In Lesson 5.1.1 you started with functions and worked backwards to find their inverse equations. Now you will focus on functions and their inverses represented as graphs. Use what you discovered yesterday as a basis for answering the questions below.

$y = 0.5x + 3$ $\quad y = 3(x+2)^2 - 6$ $\quad y = \frac{1}{6}x^3 - \frac{13}{6}x + 2$



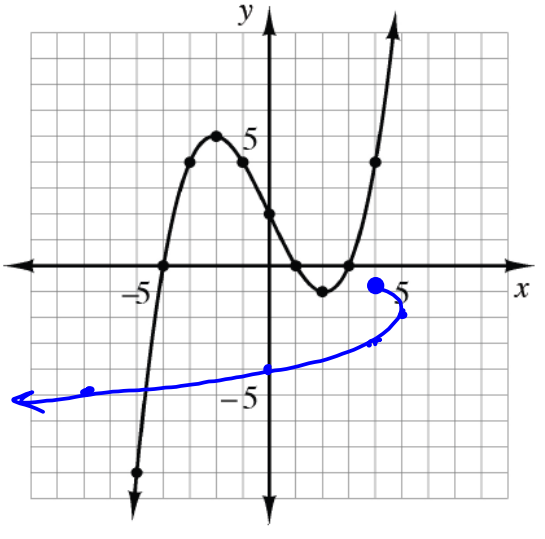
a. Obtain a Lesson 5.1.2 Resource Page from your teacher and make a careful graph of each inverse equation on the same set of axes as its corresponding function. Look for a way to make the graph without finding the inverse equation first. Be prepared to share your strategy with the class.

b. Make statements about the relationship between the coordinates of a function and the coordinates of its inverse. Use $x \to y$ tables of the function and its inverse to show what you mean.

x	y
-5	-8
-4	0
-3	4
-2	5
-1	4
0	2
1	0
2	-1
3	0
4	4

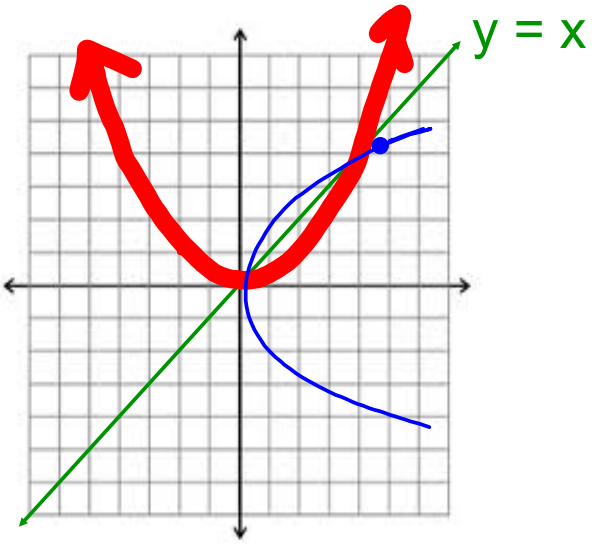
x	y
-8	-5
0	-4
4	-3
5	-2
4	-1
2	0
0	1
-1	2
0	3
4	4

$y = \frac{1}{6}x^3 - \frac{13}{6}x + 2$



18. $y = \left(\frac{x}{2}\right)^2$

x	y
0	0
±1	1/4
±2	1
±4	



Today's Classwork: CP's: 5 - # 19 ---> 23

5-19. Your graphing calculator can also help you to graph the inverse of a function. Check your inverse graph from problem 5-18 by following your teacher's instructions to use the inverse-drawing feature of your graphing calculator. Was the inverse graph that you drew correct?

enter into y=

$y_1 = (x/2)^2$

$y_2 = x$

from home screen:

2nd Draw

Choose 8: Draw Inv

Now enter the Y= function you want the inverse of:

VARS ▶ Y-VARS

Choose function and the y= location.

ENTER

5-20. Find the equation of the inverse of $y=(\frac{x}{2})^2$. Is there another way you could write it? If so, show how the two equations are the same. Justify that your inverse equation undoes the original function and use a graphing calculator to check the graphs.

Input x
$\div 2$
Square it

Inverse $\longrightarrow$

Input x
$\pm\sqrt{\ }$
times 2

$$\begin{cases} y=2\sqrt{x} \\ y=-2\sqrt{x} \end{cases}$$

5-21. Consider your equation for the inverse of $y=(\frac{x}{2})^2$.

a. Is the inverse a function? How can you tell?

b. Use color to trace over the portion of your graph of $y=(\frac{x}{2})^2$ for which $x\geq 0$. Then use another color to trace the inverse of *only this part* of $y=(\frac{x}{2})^2$. Is the inverse of this part of $y=(\frac{x}{2})^2$ a function?

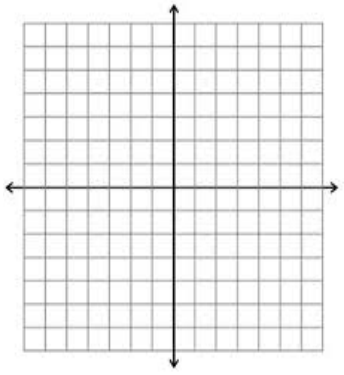
c. Find an equation for the inverse of the restricted graph of $y=(\frac{x}{2})^2$. How is this equation different from the one you found in problem 5-20?

5-22. Consider the function $f(x) = (x-3)^2$.

a. How could you restrict the domain of $f(x)$ so that its inverse will be a function?

b. Graph $f(x)$ with its restricted domain and then graph its inverse on the same set of axes.

c. Find the equation of the inverse of $f(x)$ with its restricted domain.



5-23. Is there a way to look at any graph to determine if its inverse will be a function? Explain. Find examples of other functions whose inverses are not functions.

HW: 5 -

33 ---> 39

Next Short Quiz after break:
Write a system of Inequalities from a graph.
Simplify exponents.